In the Claims:

The Claims stand as follows:

1. (Original) A hybrid digital watermarking system for video authentication, the system comprising:

an authenticated acquisition subsystem for digitally watermarking video data; and

a video management subsystem in signal communication with the authenticated acquisition subsystem for verifying the digitally watermarked video data.

2. (Original) A system as defined in Claim 1 wherein the video management subsystem is in intermittent signal communication with the authenticated acquisition subsystem.

3. (Original) A system as defined in Claim 1, the authenticated acquisition subsystem comprising a video imaging device for acquiring original video data.

4. (Original) A system as defined in Claim 1, the authenticated acquisition subsystem comprising a watermarking device for applying each of an identity signature and a control signature to the video data.

5. (Original) A system as defined in Claim 4 wherein the control signature comprises fragile control bits and robust control bits.

6. (Original) A system as defined in Claim 4 wherein the identity signature and the control signature are applied to the video data concurrent with real-time acquisition of the video data.

7. (Original) A system as defined in Claim 4 wherein the identity signature and the control signature are embodied in a single hybrid digital watermark.

8. (Original) A system as defined in Claim 7 wherein the single hybrid digital watermark achieves progressively varying robustness in a single watermark by means of at least one of error-correcting signature coding and rate-distortion guided bit embedding.

9. (Original) A system as defined in Claim 1, the video management subsystem comprising a verification device for verifying a control signature and an identity signature.

10. (Original) A system as defined in Claim 9 wherein the identity signature and the control signature are extracted from a single digital watermark.

11. (Original) A system as defined in Claim 1, the video management subsystem comprising a watermark verifying playback device for verifying a control signature and an identity signature and displaying verified video data.

12. (Original) A system as defined in Claim 11 wherein the watermark verifying playback device alerts a user to the presence of altered video content.

13. (Original) A method of hybrid digital watermarking for video authentication, the method comprising:

digitally watermarking video data; and

verifying the digitally watermarked video data.

14. (Original) A method as defined in Claim 13, further comprising intermittently transmitting the digitally watermarked video data prior to verification.

15. (Original) A method as defined in Claim 13, further comprising compressing the digitally watermarked video data prior to verification.

16. (Original) A method as defined in Claim 15 wherein compressing comprises Moving Pictures Expert Group ("MPEG") encoding the digitally watermarked video data prior to verification.

17. (Original) A method as defined in Claim 16 wherein compressing comprises MPEG-2 encoding the digitally watermarked video data prior to verification.

18. (Original) A method as defined in Claim 16 wherein compressing comprises MPEG-4 encoding the digitally watermarked video data prior to verification.

19. (Original) A method as defined in Claim 13, further comprising acquiring original video data.

20. (Original) A method as defined in Claim 19 wherein the acquired original video data is in Digital Video ("DV") format.

21. (Original) A method as defined in Claim 13, further comprising applying each of an identity signature and a control signature to the video data.

22. (Original) A method as defined in Claim 21 wherein the control signature comprises fragile control bits and robust control bits.

23. (Original) A method as defined in Claim 21, further comprising embedding bits of the control signature into data blocks in accordance with a pseudo-random sequence that introduces a dependency among the blocks.

24. (Original) A method as defined in Claim 23, further comprising:

extracting a data-dependent seed from at least one frame; and

generating the pseudo-random sequence from the extracted seed.

25. (Original) A method as defined in Claim 24, further comprising generating the seed for the pseudo-random sequence in accordance with a hash function.

26. (Original) A method as defined in Claim 25 wherein the seed is responsive to at least one DC coefficient.

27. (Original) A method as defined in Claim 26, further comprising applying a coarse quantizer to the at least one DC coefficient prior to seed generation.

28. (Original) A method as defined in Claim 27 wherein the at least one DC coefficient is selected from a plurality of data blocks having a DC coefficient value close to a quantization level of the coarse quantizer.

29. (Original) A method as defined in Claim 21 wherein the identity signature and the control signature are applied to the video data concurrent with real-time acquisition of the video data.

30. (Original) A method as defined in Claim 21 wherein the identity signature and the control signature are embodied in a single hybrid digital watermark.

31. (Original) A method as defined in Claim 30, further comprising at least one of:

coding error-correcting signatures in the single hybrid digital watermark; and

embedding rate-distortion guided bits in the single hybrid digital watermark to achieve progressively varying robustness.

32. (Original) A method as defined in Claim 13, further comprising verifying a control signature and an identity signature.

33. (Original) A method as defined in Claim 32 wherein the identity signature and the control signature are extracted from a single digital watermark.

34. (Original) A method as defined in Claim 13, further comprising:

verifying a control signature and an identity signature; and

displaying verified video data.

35. (Original) A method as defined in Claim 34, further comprising producing an alert responsive to the presence of altered video content.

36. (Original) A method as defined in Claim 15, further comprising detecting tampering in coordination with knowledge specific to the compression domain.

37. (Original) A method as defined in Claim 36 wherein the compression domain comprises DCT encoded data.

38. (Original) A method as defined in Claim 36 wherein the knowledge specific to the compression domain comprises at least one of spatial and temporal dependencies.

39. (Original) A method as defined in Claim 36, further comprising:

assigning a likelihood value for possible tampering to each error block based its number of neighbors; and

temporally integrating the likelihood values to compute a score map indicative of potentially tampered regions.

40. (Withdrawn) A digital video data file encoded with signal data comprising a plurality of block transform coefficients, the coefficients collectively indicative of an original video data sequence with an added hybrid watermark, the watermark comprising each of an identity signature and a control signature.

41. (Withdrawn) A digital video data file as defined in Claim 40 wherein the control signature comprises fragile control bits and robust control bits.

42. (Withdrawn) A digital video data file as defined in Claim 40, the data file achieving progressively varying robustness in a single watermark by means of at least one of error-correcting signature coding and rate-distortion guided bit embedding.

43. (Withdrawn) A digital video data file as defined in Claim 42, the data file being embodied in a Digital Video Disk ("DVD").

44. (Original) A hybrid digital watermarking system for video authentication as defined in Claim 1, the system further comprising watermark means for digitally watermarking the video data.

45. (Original) A system as defined in Claim 44, further comprising verification means in signal communication with the watermark means for verifying the digitally watermarked video data.

46. (Original) A system as defined in Claim 45, further comprising transmission means for intermittently transmitting the digitally watermarked video data prior to verification.

47. (Original) A system as defined in Claim 45, further comprising compression means for compressing the digitally watermarked video data prior to verification.

48. (Original) A system as defined in Claim 47 wherein the compression means comprises encoding means for Moving Pictures Expert Group ("MPEG") encoding the digitally watermarked video data prior to verification.

49. (Original) A system as defined in Claim 48 wherein the encoding means comprises MPEG-2 encoder means for encoding the digitally watermarked video data prior to verification.

50. (Original) A system as defined in Claim 48 wherein the encoding means comprises MPEG-4 encoder means for encoding the digitally watermarked video data prior to verification.

51. (Original) A system as defined in Claim 45, further comprising imaging means for acquiring original video data.

52. (Original) A system as defined in Claim 51 wherein the imaging means acquires original video data in Digital Video ("DV") format.

53. (Original) A system as defined in Claim 45, further comprising signature means for applying each of an identity signature and a control signature to the video data.

54. (Original) A system as defined in Claim 53 wherein the signature means applies the identity signature and the control signature to the video data concurrent with real-time acquisition of the video data.

55. (Original) A system as defined in Claim 53 wherein the signature means is in signal communication with the watermark means for combining the identity signature and the control signature in a single hybrid digital watermark.

56. (Original) A system as defined in Claim 55, further comprising at least one of:

coding means for coding error-correcting signatures in the single hybrid digital watermark; and

embedding means in signal communication with the encoding means for embedding rate-distortion guided bits in the single hybrid digital watermark to achieve progressively varying robustness.

57. (Original) A system as defined in Claim 55, further comprising verification means for verifying a control signature and an identity signature.

58. (Original) A system as defined in Claim 57 wherein the verification means extracts the identity signature and the control signature from a single digital watermark.

59. (Original) A system as defined in Claim 55, further comprising:

signature verification means for verifying at least one of a control signature and an identity signature; and

display means in signal communication with the signature verification means for displaying verified video data.

60. (Original) A system as defined in Claim 59, further comprising alert means for producing an alert responsive to the presence of altered video content.

61. (Original) A system as defined in Claim 47, the verification means comprising tamper detection means responsive to knowledge specific to the compression domain.

62. (Original) A system as defined in Claim 61 wherein the compression domain comprises DCT encoded data.

63. (Original) A system as defined in Claim 61 wherein the knowledge specific to the compression domain comprises at least one of spatial and temporal dependencies.

64. (Original) A system as defined in Claim 61, further comprising:

likelihood means for assigning a likelihood value for possible tampering to each error block based its number of neighbors; and

temporal integration means for temporally integrating the likelihood values to compute a score map indicative of potentially tampered regions.

65. (Original) A system as defined in Claim 53 wherein the signature means embeds signature bits into data blocks in accordance with a pseudo-random sequence that introduces a dependency among the blocks.

66. (Original) A system as defined in Claim 65 wherein the pseudo-random sequence is generated from a data-dependent seed extracted from at least one frame.

67. (Original) A system as defined in Claim 66 wherein the seed for generating the pseudo-random sequence is itself generated using a hash function.

68. (Original) A system as defined in Claim 67 wherein the seed is responsive to at least one DC coefficient.

69. (Original) A system as defined in Claim 68 wherein the at least one DC coefficient is coarsely quantized prior to seed generation.